

Attorney Docket No. 18343-035

Applicant: Shonburg et al.
Filed: August 3, 2001
Serial No. 09/921,826
For: Method and Apparatus For Natural Language Dialog Interface
Examiner: Not Yet Assigned
Art Unit: Not Yet Assigned

Commissioner for Patents and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination, Applicants respectfully request that the present application be amended as indicated below:

In the Specification

On page 6, line 14, please insert the word "by" between the words "determined" and "an initialization".

On page 6, line 19, please replace the phrase "form on constrained" with the phrase --form of constrained--.

On page 6, line 22, please replace the phrase "an user's" with the phrase --a user's--.

On page 6, line 34, please replace the word "includes" with --include--.

On page 7, line 27, please replace the phrase "Fig. 8." With --Fig. 7.-- .

On page 9, line 17, please replace the word "bellow" with --below-- .

On page 14, line 31, please replace the phrase "REPY" with --REPLY-- .

On page 17, line 14, please replace the phrase "are response" with --a response--.

On page 24, line 22, please replace the phrase "are no" with --is no--.

On page 26, line 28, please replace the phrase "If there is" with --If there are--.

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In the abstract

Please add the following abstract to the application:

ABSTRACT

A system for interactive dialog management between a user and a computer system is provided. The system includes an input interface, a preprocessing module, a pattern knowledge database, a pattern recognition module, first, second and third control modules, and an output interface. The input interface receives an input phrase from a user and the preprocessing module converts the received input phrase into at least one pattern. The pattern knowledge database stores a plurality of patterns, each pattern comprising at least one element selected from the group consisting of words, phrases, and combinations of words and phrases. The pattern recognition module identifies elements in the converted input phrase, and locates at least one matching pattern in the pattern knowledge database. In response to each matching pattern in the input phrase, the first control module creates a plurality of potential outputs based upon the matching pattern and at least one rule. The second control module defines at least one condition for selection of a potential output from the plurality of potential outputs. The third control module interprets the input phrase, selecting an output, and generating a response in accordance with information provided by the pattern recognition module and the first and second control modules. The output interface provides the response to the user.

In the claims:

Please delete claim 1 without prejudice or disclaimer.

Please add the following new claims:

2. (New) A system for processing a natural language input, comprising:
 - a set of trees, each tree defining a meaning for a respective phrase;
 - means for receiving a natural language input;
 - means for comparing the natural language input to each tree in the set of trees to determine a value representing the closeness of a match between the natural language input and the phrase associated with a given tree; and
 - means for selecting a tree to define the meaning of the natural language input based upon the value.
3. (New) The system of claim 1 wherein the means for selecting further comprises means for applying a set of rules to each value.
4. (New) The system of claim 3 wherein the means for applying a set of rules operates in accordance with a set of discourse rules.
5. (New) The system of claim 4 wherein the set of discourse rules relate to at least one of the following: the subject of the natural language input, the context of the natural language input, at least one previous natural language input, the source of the natural language input, dialogue rules, and an application in which the system is operating.
6. (New) The system of claim 5 wherein the set of discourse rules works in connection with a set of rules relating to at least one goal control applicable to the processing of the natural language input.

7. (New) The system of claim 5 wherein the set of discourse rules works in connection with a set of rules relating to at least one emotion control applicable to the processing of the natural language input.
8. (New) A method for processing a natural language input, comprising the steps of:
providing a set of trees, each tree defining a meaning for a respective phrase;
receiving a natural language input;
comparing the natural language input to each tree in the set of trees to determine a value representing the closeness of a match between the natural language input and the phrase associated with a given tree; and
selecting a tree to define the meaning of the natural language input based upon the value.
9. (New) The method of claim 6, further comprising the step of applying a set of discourse rules to each value.
10. (New) A system for processing a natural language input, comprising:
means for receiving a natural language phrase;
means for interpreting the natural language phrase based on a first set of rules; and
means for generating a response to the natural language phrase in accordance with a second set of rules.
11. (New) The system of claim 10, wherein the means for interpreting the natural language phrase further comprises:
a set of trees, each tree defining a meaning for a respective phrase;
means for receiving a natural language input;
means for comparing the natural language input to each tree in the set of trees to determine a value representing the closeness of a match between the natural language input and the phrase associated with a given tree; and

means for selecting a tree to define the meaning of the natural language input based upon the value.

12. (New) The system of claim 10, wherein the means for generating a response to the natural language phrase further comprises means for applying at least one of the following sets of rules to the natural language phrase: discourse rules, goal control rules, and emotion control rules.
13. (New) A method for processing a natural language input, comprising the steps of:
 - receiving a natural language phrase;
 - interpreting the natural language phrase based on a first set of rules; and
 - generating a response to the natural language phrase in accordance with a second set of rules.
14. (New) The method of claim 13, further comprising the steps of
 - providing a set of trees, each tree defining a meaning for a respective phrase;
 - receiving a natural language input;
 - comparing the natural language input to each tree in the set of trees to determine a value representing the closeness of a match between the natural language input and the phrase associated with a given tree; and
 - selecting a tree to define the meaning of the natural language input based upon the value.
15. (New) The method of claim 14, further comprising the steps of:
 - applying at least one of the following sets of rules to the natural language phrase: discourse rules, goal control rules, and emotion control rules.
16. (New) A system for interactive dialog management comprising:
 - a pattern recognition module identifying elements in an input phrase and locating matching patterns in pattern knowledge bases;

a discourse control module for regulating a conversation flow in a human-like way and creating a set of suitable outputs corresponding to a particular input based upon the matching patterns and upon stored goals and emotional information;

an output interface providing the response of the system to the user; and

a meta-control module for coordinating work managing the context of a dialog by using information from the discourse control module.

17. (New) A system for interactive dialog management between a user and a computer system, comprising:
- an input interface receiving an input phrase from a user;
 - a preprocessing module converting the received input phrase into at least one pattern;
 - a pattern knowledge database storing a plurality of patterns, each pattern comprising at least one element selected from the group consisting of words, phrases, and combinations of words and phrases;
 - a pattern recognition module in operable communication with the preprocessing module and the pattern knowledge database, the pattern recognition module identifying elements in the converted input phrase and locating at least one matching pattern in the pattern knowledge database;
 - a first control module creating, in response to each matching pattern in the input phrase, a plurality of potential outputs based upon the matching pattern and at least one rule;
 - a second control module defining at least one condition for selection of a potential output from the plurality of potential outputs;
 - a third control module in operable communication with the first and second control modules and the pattern recognition module, the third control module interpreting the input phrase, selecting an output, and generating a response in accordance with information provided by the pattern recognition module and the first and second control modules; and
 - an output interface providing the response to the user.

18. (New) A computer implemented method for conducting a natural language dialog with a user, comprising the steps of:

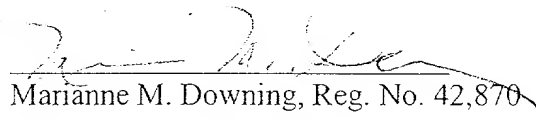
- receiving a natural language phrase from a user;
- determining the subject of the phrase;
- identifying at least one pattern in the phrase;
- comparing the identified pattern to a plurality of stored patterns, each stored pattern associated with a rule regulating the interpretation of the phrase;
- computing a matching score for each comparison between the at least one pattern in the phrase and each stored pattern, the matching score based at least in part on the subject of the phrase;
- selecting a subset of the stored patterns having the best matching scores;
- applying at least one dialog control rule to the subset to filter the best matching stored pattern from the subset;
- interpreting the best matching stored pattern in accordance with its respective rule;
- generating a plurality of possible responses to the user based on the interpretation of the best matching stored pattern;
- selecting a response to the user from the plurality of possible responses based on at least one of a goal control rule and an emotion control rule; and
- providing the selected response to the user.

REMARKS

Prior to examination, Applicants request that the present application be amended as identified above. The amendments to the specification are to correct minor typographical errors. The amendment to the abstract adds an abstract, which was inadvertently not provided with the application as filed. With the amendments herein, claims 2-18 are pending in this application, with claims 2, 8, 10, 13, 16, 17, and 18 being in independent format.

This application is believed be in condition for allowance, and a statement to this effect is respectfully requested. Should any questions or issues arise concerning this application, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

Respectfully submitted,



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